GOVERNMENT OF INDIA
EARTH SCIENCES
LOK SABHA

STARRED QUESTION NO:245
ANSWERED ON:02.08.2017
Biogeochemical/Biological Changes of Coastal Seas
Roy Prof. Saugata

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether the Government proposes to conduct a thorough study on various aspects of biogeochemical and biological changes of coastal seas of western parts of the country;

(b) if so, the details thereof and the objectives of the study along with the institutes involved in the study;

(c) whether the human intervention affects the environment of the coast of western India; and

(d) if so, the details thereof?

Answer

THE MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND
MINISTRY OF EARTH SCIENCES
(DR.HARSH VARDHAN)

(a)-(d) A statement is laid on the Table of the House.

STATEMENT LAID ON THE TABLE OF THE LOK SABHA IN REPLY (a) to (d) TO STARRED QUESTION NO. *245 REGARDING "BIOGEOCHEMICAL/BIOLOGICAL CHANGES OF COASTAL SEAS" TO BE ANSWERED ON WEDNESDAY, AUGUST 2, 2017

(a)&(b) The ministry has been implementing a project to study various aspects of biogeochemistry in the seas around India including east and west coast of India for over decade. The Biogeochemistry is a multi-disciplinary subject that interacts with physical, chemical, biological, and geological processes and reactions that govern the composition of and changes to the natural environment. A system, scientific and long-term study on biogeochemistry of the seas around India was launched by MoES in 2010 with the participation of a network of national scientific and academic institutions. There are 24 sub-projects under the program addressing various aspects of biogeochemical aspects at an estimated cost of Rs 47 crores. The participating agencies include National Institute of Oceanography (NIO), Goa, Physical Research Laboratory (PRL), Ahmedabad, Central Marine Living Resources, (CMLRE) Kochi, Central Marine Fishery Research Institute (CMFRI). Cochin University of Science and Technology (CUSAT), Kochi, Andhra University, Goa University, Mangalore University. The study contributes towards understanding climate change and marine biogeochemistry. This program envisaged collection of time-series data both in the Open Ocean and estuarine/coastal waters of India. A set of 3 time-series observing stations were established on the west coast of India near Kochi, Condolim Goa and in the Arabian Sea.

The overarching objective is to carry out multi-disciplinary research at selected locations covering, core physical, chemical and biological parameters with a view to understanding the carbon and nitrogen biogeochemical process including associated trace elements in the seas around India. The key mission of the project is to assess the impact of natural and anthropogenic forcing on the biogeochemical cycles and ecosystem dynamics of the Arabian Sea and the Bay of Bengal and study the human induced changes in climate and nutrient loading impact on the marine ecosystem and biogeochemical cycles. The various important parameters being monitored periodically include chlorophyll, pH, dissolved, oxygen, nutrients such as dissolved nitrogen (nitrate, Nitrite), phosphorus, organic and inorganic carbon, bacteria, temperature, and salinity etc.

The dissolved nutrients are the main food source for the algae (phytoplankton) which forms the primary producers in the marine food chain. Biogeochemistry addresses various sources and sinks of these nutrients, their transformations and flow in the food chain through various sizes of organisms from small phytoplankton to large fishes. Indeed biogeochemistry drives the biology of the sea which in turn is influenced by the variation in physical oceanographic processes (winds, currents, waves, air-sea interaction, etc.). Excessive nutrients availability in the sea, supplied from rivers, atmospheric deposition, natural processes, etc. shall facilitate the blooming of phytoplankton, normally referred to algal blooms. The biological productivity in the surface ocean is largely controlled by the vertical movement of deep nutrient rich waters to the surface ocean, which is called upwelling.. The coastal sea along the western India encompassing five coastal states (Kerala, Karnataka, Goa, Maharashtra and Gujarat) has diverse environmental conditions. The intensity and period of upwelling largely define the environmental status and suitability in supporting the coastal fishery resources along western India. These studies have contributed significantly towards understanding the biogeochemistry of the coastal seas of the west coast of India.

(c)&(d) No, Madam. Preliminary investigations reveal that the natural oceanographic process such as seasonal upwelling occur along the southwest coast of India appear to play a major role rather human interventions on the marine environment. A long term monitoring of coastal pollution studies being carried out by MoES over a period of 2 dacades also indicates that the impact of land based pollutants entering into coastal water is largely confined to very close to coast of India. The data further indicates that the concentration of the nutrients and population of pathogenic bacteria are confined to 1 − 2 km at these locations except in Mumbai. A suite of 25 pollution parameters including physical, chemical, biological and microbiological characteristics of water and sediment at selected locations at 20 different locations are monitored which vary from both in space and time.